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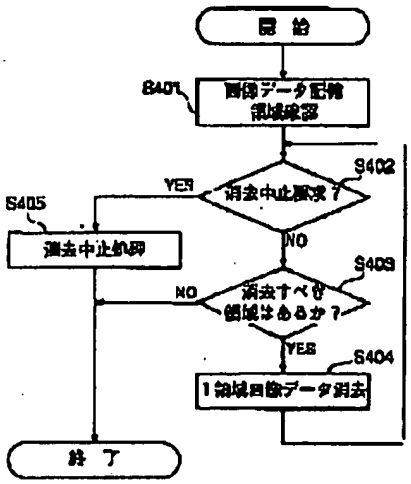
(54) IMAGE PROCESSING DEVICE AND METHOD THEREOF

(57)Abstract:
PROBLEM TO BE SOLVED: To provide the image processing device and method which can attain the satisfactory security for the image data that are stored in a memory.
SOLUTION: A specific area of a hard disk where the copied image data are stored is confirmed (S401), and it is decided whether an erasion discontinuation request is inputted for the image data (S402). If the request is not inputted (NO), it is decided whether or not the disk includes an area to erase the image data (403). If the area is included in the disk (YES), the image data stored in one of areas where the image data should be erased are erased. Then the procedure returned to the processing of S402. The processing procedures of steps S402 to S404 are repeated until an erasion discontinuation request is inputted or no areas exist any more to erase the image data.



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A. Relevance of the Above-identified Document

This document has relevance to claims 1, 2 and 5 of the present application.

[EMBODIMENTS]

[0051]

Figure 4 is a flow chart showing operation procedure performed by the foregoing image processing device, for processing image data stored in the hard disk 304b. The procedure shown in the flow chart is carried out in an idling time of the image processing device after completing photocopying operation. Note that, the program for performing the procedure of the flow chart is stored in the ROM 207 of the CPU circuit section 205, and is executed by the CPU 206.

[0052]

The first step of the procedure is finding an area of the hard disk 304b, where the image data is stored after photocopying (Step S401). Then, when the area is found, the second step is performed to judge if there is a request for stopping the deletion of the data (Step S402), which is supposed to be inputted upon request for photocopying,

for example.

[0053]

If the judgment in the step S402 results in Yes, the image data stored in the hard disk 304b is not deleted, and the operation of the flow chart is finished.

[0054]

If the judgment in the step S402 results in No, the next step is performed to judge weather or not the hard disk 304b has an area to be deleted (Step S403), and if this judgment results in No, the operation of the flow chart is finished.

[0055]

If the judgment in the step S403 results in Yes, the image data stored in one of the areas subjected to deletion in the hard disk 304b is deleted, and then the sequence goes back to the step S402. The steps S402 through S404 are repeated until the request for stopping the deletion is made, or until the all areas subjected to deletion are deleted.

[0056]

As described, according to the present embodiment, the image processing device carries out deletion of the image data after photocopying unless the request for stopping the deletion is made, thus providing sufficient security of the documents.

[0057]

Further, the deletion operation of the image data is performed in the idling time of the image processing device after completing the photocopying, thus allowing the user to carry out photocopying without taking account of the deletion operation.

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the image processing system equipped with the electronic sort function, and its image-processing approach.
[0002]
[Description of the Prior Art] Conventionally, the image data of a manuscript is read and the digital reproducing unit equipped with the electronic sort function which once memorizes in memory, such as a hard disk, is beginning to read the image data of the manuscript of arbitration repeatedly by desired number of copies from the memory, and prints out the image data is known. According to the digital image processing system equipped with an electronic sort function, even if it does not have sorter equipment which has two or more bottles, it is possible to deliver paper, where copy paper is sorted.
[0003] In such an image processing system, when it was managed to which field in memory image data is read from whether image data is memorized and which field with management data called FAT (FILE ALLOCATION TABLE) and it updated FAT, modification of the image data in the memory concerned etc. was managed.
[0004]
[Problem(s) to be Solved by the Invention] However, it was possible that the image data of the document which copy processing has already ended in the memory until new data are overwritten by memory, when copy processing of a document with high confidentiality or the document which be not known to others is carried out remains, and there was a trouble that confidentiality was not fully protected, only by renewal of FAT.
[0005] This invention was made in order to solve the above-mentioned trouble, and it aims at offering the image processing system which can attain sufficient security of the image data memorized by memory.
[0006]
[Means for Solving the Problem] It is characterized by to have a processing means process the image data outputted by said output means to predetermined timing among the image data memorized by an output means the image processing system of claim 1 reads the image data memorized by a storage means memorize image data, and said storage means in order to attain the above-mentioned purpose, and output, and said storage means.
[0007] It is characterized by the image data to which the image processing system of claim 2 should be outputted among the image data said predetermined timing was remembered to be by said storage means in the image processing system according to claim 1 being the timing immediately after outputting with said output means.
[0008] The image processing system of claim 3 is characterized by the image processing system concerned being the timing which will be in a standby condition by said predetermined timing in an image processing system according to claim 1.
[0009] The image processing system of claim 4 is equipped with a current supply means to supply

supply voltage to the image processing system concerned, in an image processing system according to claim 1, and said predetermined timing is characterized by being the timing from which said a part of current supply means will be in a idle state.
[0010] The image processing system of claim 5 is characterized by said processing means eliminating the image data memorized by said storage means as said processing in an image processing system given in any 1 term of claims 1-4.
[0011] The image processing system of claim 6 is characterized by said processing means performing scramble processing of the image data memorized by said storage means as said processing in an image processing system given in any 1 term of claims 1-4.
[0012] The image processing system of claim 7 is characterized by equipping said processing means with a processing termination means to stop processing by said processing means when high interruption of priority enters from processing by said processing means in an image processing system given in any 1 term of claims 1-6.
[0013] The image-processing approach of the image processing system of claim 8 memorizes image data, reads and outputs said memorized image data, and is characterized by processing said outputted image data to predetermined timing among said memorized image data.
[0014] It is characterized by the image-processing approach of the image processing system of claim 9 being the timing immediately after outputting the image data to which said predetermined timing should be outputted among said memorized image data in the image-processing approach of an image processing system according to claim 8.
[0015] The image-processing approach of the image processing system of claim 10 is characterized by the image processing system concerned being the timing which will be in a standby condition by said predetermined timing in the image-processing approach of an image processing system according to claim 8.
[0016] Said predetermined timing is characterized by a part of current supply means by which the image-processing approach of the image processing system of claim 11 supplies supply voltage to the image processing system concerned in the image-processing approach of an image processing system according to claim 8 being the timing which will be in a idle state.
[0017] The image-processing approach of the image processing system of claim 12 is characterized by said processing being elimination of said memorized image data in the image-processing approach of an image processing system given in any 1 term of claims 8-11.
[0018] The image-processing approach of the image processing system of claim 13 is characterized by said processing being scramble processing of said memorized image data in the image-processing approach of an image processing system given in any 1 term of claims 8-11.
[0019] In the image-processing approach of an image processing system given in any 1 term of claims 8-13, the image-processing approach of the image processing system of claim 14 is characterized by stopping said processing, when high interruption of priority enters from said processing.
[0020]
[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing.
[0021] (Gestalt of the 1st operation) The gestalt of operation of the 1st of this invention is first explained with reference to drawing 1 - drawing 4 .
[0022] Drawing 1 is the vertical section side elevation showing the configuration of the image processing system concerning the gestalt of this operation. In this drawing, an image processing system mainly consists of a body 100 of equipment, and a circuit system automatic manuscript feed gear (RDF) 180. RDF180 has the manuscript loading tray 1 which carries out the loading set of the manuscript S. It inclines caudad and this manuscript loading tray 1 is arranged as it goes in the direction of a manuscript send so that a manuscript sending area may become low. Thereby, the manuscripts S to which paper is fed are together loaded in the direction of a send.
[0023] With two or more rollers in RDF180, one sheet dissociates at a time and the manuscript S loaded into the manuscript loading tray 1 is sent to up to platen glass 101.

[0024] 102 is a scanner and the scanner 102 consists of a manuscript lighting lamp 103 and scan mirror 104 grade. A both-way scan is carried out in the predetermined direction by the non-illustrated motor, and a scanner 102 receives the reflected light from Manuscript S. Image formation of the reflected light is carried out to the image-sensors section 109 using a CCD sensor through the scan mirrors 104-106 and a lens 108.
[0025] 120 is the exposure control section which consisted of laser, a polygon scanner, etc., and irradiates the laser beam 129 modulated based on the picture signal with which it was changed into the electrical signal in the image-sensors section 109, and the predetermined image processing was performed at the photo conductor drum 110.
[0026] The surroundings of the photo conductor drum 110 are equipped with the primary charged body 112, a development counter 121, the imprint electrification machine 118, cleaning equipment 116, and the pre-exposure lamp 114, and these constitute the image formation section 126. In this image formation section 126, after the photo conductor drum 110 is rotating in the direction of the arrow head shown in drawing 1 by the non-illustrated motor and being charged in desired potential with the primary electrification vessel 112, a laser beam 129 can be irradiated from the exposure control section 120, and, thereby, an electrostatic latent image is formed on the photo conductor drum 110.
[0027] The electrostatic latent image formed on the photo conductor drum 110 is developed by the development counter 121, and is visualized as a toner image.
[0028] On the other hand, the transfer paper (copy paper) to which paper was fed with the pickup roller 133 from the upper case cassette 131 is sent to the body 100 of equipment with the feed roller 135. Moreover, the transfer paper to which paper was fed with the pickup roller 134 from the lower-berth cassette 132 is sent to the body 100 of equipment with the feed roller 136. The imprint belt 130 is fed with the transfer paper sent to the body of equipment with the resist roller 137, and the visualized toner image is imprinted by the transfer paper with the imprint electrification vessel 118. A residual toner is cleaned by the cleaning device 116 and, as for the photo conductor drum 110 after an imprint, residual charge is eliminated with the pre-exposure lamp 114.
[0029] It dissociates from the imprint belt 130, the transfer paper after an imprint is sent to the electrification machines 139 and 140 before fixing, and the imprinted toner image is re-charged. After a transfer paper is further sent to a fixing assembly 141 and a toner image is fixed to it by pressurization and heating, it is discharged by the exterior of the body 100 of equipment with the discharge roller 142.
[0030] Moreover, the image formation section 126 became the adsorption zone electrical machinery 119 and a pair, and equips the imprint belt 130 with the imprint belt roller (un-illustrating) which carries out adsorption electrification of the transfer paper at the same time it is used for the adsorption zone electrical machinery 119 which makes the transfer paper sent from the resist roller 137 stick to the imprint belt 130, and rotation of the imprint belt 130.
[0031] The above-mentioned body 100 of equipment is equipped with the deck 150 which can contain the transfer paper of 4000 sheets. The lifter 151 of the deck 150 goes up according to the amount of a transfer paper so that a transfer paper may always contact the feed roller 152. Moreover, the multiple-manual-feeding device 153 which can contain the transfer paper of 100 sheets, for example is equipped.
[0032] Furthermore, in drawing 1 , 154 is a delivery flapper and switches the path of a transfer paper to either of the path by the side of double-sided record and multiplex record, and the path by the side of delivery. The transfer paper sent out from the delivery roller 142 is sent to the path by the side of double-sided record and multiplex record, or the path by the side of delivery by switch of the path by this delivery flapper 154. Moreover, 158 is bottom conveyance pass, through the reversal pass 155, turns a transfer paper over and leads the transfer paper sent out from the delivery roller 142 to the re-medium tray 156. Moreover, 157 is a multiplex flapper which switches a path to either of the path by the side of double-sided record, and the path by the side of multiplex record. By switch of the multiplex flapper 157, a transfer paper can be led to the conveyance-under direct pass 158, without minding the reversal pass 155. 159 is a feed roller which leads a transfer paper to the photo conductor drum 110 side through a path 160. Moreover, 161 is a discharge roller which discharges the transfer paper which has been arranged near the delivery flapper 154 and sent to the path by the side of delivery by switch of this

delivery flapper 154 to the exterior of the body 100 of equipment.
[0033] At the time of double-sided record (double-sided copy) or multiplex record (multiplex copy), the delivery flapper 154 is raised up. Thereby, it changes a transfer paper [finishing / a copy] into the condition of having turned over through the conveyance pass 155 and 158, and it is stored in the re-medium tray 156. At the time of double-sided record, a transfer paper is sent to the reversal pass 155 by switch of the multiplex flapper 157. Moreover, the transfer paper stored in the re-medium tray 156 is led one sheet at a time to the resist roller 137 of the body 100 of equipment through a path 160 with the feed roller 159 from the bottom at the time of multiplex record.
[0034] When reversing and discharging a transfer paper from the body 100 of equipment, the delivery flapper 154 is raised upwards, and the multiplex flapper 157 is switched so that a transfer paper [finishing / a copy] may be conveyed to the conveyance pass 155. After it is sent to the conveyance pass 155 from the multiplex flapper 157 and the back end of a transfer paper passes the 1st delivery roller 162, a transfer paper is conveyed with the reversal roller 163 to the 2nd delivery roller 162a side, is over turned with the discharge roller 161, and is discharged in the exterior of the body 100 of equipment.
[0035] Drawing 2 is the block diagram showing the configuration of the principal part of the image processing system shown in drawing 1 . In this drawing, the image read station 201 as a reading means is constituted by a lens 108, the image-sensors section 109, and analog signal processing section 202 grade. The manuscript image by which image formation was carried out to the image-sensors section 109 through the lens 108 is changed into an analog electrical signal by the image-sensors section 109. After being inputted into the analog signal processing section 202 and performing sample & hold, amendment of dark level, etc., analog-to-digital conversion (A/D conversion) of the changed image information is carried out. The digitized signal is inputted into the electronic sorter section 203 as image data after a shading compensation (amendment of dispersion of the sensor which reads a manuscript, and the luminous-intensity-distribution property of the lamp for manuscript lighting), and variable power processing.
[0036] Moreover, the external-interface (I/F) processing section 209 develops the image information inputted from the computer (un-illustrating) connected outside, and creates binary picture data. The created binary picture data are inputted into the electronic sorter section 203.
[0037] In the electronic sorter section 203, amendment processing required of output systems, such as gamma amendment, to the image data inputted from the analog signal processing section 202 or the external-interface processing section 209, smoothing processing and edge enhancement processing, other processings, processing, etc. are performed. The image data processed in the electronic sorter section 203 is outputted to the printer section 204 as an output means.
[0038] The printer section 204 is constituted by the exposure control section 120 which consists of laser explained by drawing 1 , the image formation section 126, the transfer-control section of a transfer paper, etc., and records an image on a transfer paper according to the inputted image data.
[0039] The CPU circuit section 205 is constituted by arithmetic and program control (CPU) 206, a read-only memory (ROM) 207, and read-out write-in memory (RAM) 208 grade, and has the function which controls the sequence of the image read station 201, the electronic sorter section 203, printer section 204 grade, and this image processing system in generalization.
[0040] Drawing 3 is the block diagram showing the detailed configuration of the electronic sorter section 203. In this drawing, the electronic sorter section 203 has the log transducer 301, the binarization section 302, a control section 303, the image storage section 304, the smooth section 305, and gamma amendment section 306, and components 301, 302, 303, 305, and 306 are connected to the serial in this sequence. The image storage section 304 and the external I/F processing section 209 mentioned above which memorizes image data are connected to the control section 303.
[0041] The image data sent from the image read station 201 is inputted as black (Black) brightness data, and is sent to the log transducer 301. The digital service unit (LUT) for changing the inputted brightness data into concentration data is formed in the log transducer 301, and brightness data are changed into concentration data by outputting the table value over the inputted data.

[0042] Then, concentration data are sent to the binarization section 302. In the binarization section 302, binarization of the concentration data of a multiple value is carried out, for example, a concentration value is set to "0" or "255." The 8-bit image data by which binarization was carried out is changed into the 1-bit image data of "0" or "1." Thereby, the image amount of data memorized by memory decreases.
[0043] However, if binarization of the image data is carried out, since the number of gradation of an image will become 2 gradation from 256 gradation, when binarization of the image data with much halftone like a photograph is carried out, generally degradation of an image is remarkable. Then, it is necessary to carry out the false halftone expression by binary data.
[0044] Here, an error diffusion method is used as the technique of performing a halftone expression in false by binary data. It is the approach of distributing the difference of the data by which presupposed that it is concentration data of "255" when this approach had the concentration of a certain pixel larger than a predetermined threshold, and binarization was carried out to actual concentration data after carrying out binarization noting that the case where it was below a predetermined threshold was concentration data of ** "0" to the surrounding pixel of the pixel concerned as an error signal. Allocation with error multiplies the weighting factor on the matrix currently prepared beforehand to the error produced by binarization, and is performed by adding the value acquired as a result to a surrounding pixel. Thereby, the concentration average of the whole image is saved, it is binary in false and halftone can be expressed.
[0045] The image data by which binarization was carried out is sent to a control section 303. Moreover, the image data from the external computer inputted from the external I/F processing section 209 is processed as binary picture data in the external I/F processing section 209, and is inputted into a control section 303 as it is.
[0046] In a control section 303, control which memorizes the image data of the manuscript which copies in the image storage section 304 by the command from the body 100 of equipment, and control which reads and outputs the image data memorized by the image storage section 304 are performed.
[0047] The image storage section 304 has SCSI (SCSI) controller 304a and (hard disk HD) 304b as a storage means, and image data is memorized by hard disk 304b with directions of SCSI controller 304a. As for the image data memorized by hard disk 304a, the storage region etc. is managed by FAT (FILE ALLOCATION TABLE). FAT is stored in RAM208 in the CPU circuit section 205, and is managed in generalization by CPU. FAT is updated whenever modification, elimination, etc. of image data which are memorized by hard disk 304b are performed.
[0048] The image data memorized by hard disk 304b is outputted in the sequence according to the edit mode specified by the control unit (un-illustrating) of the body 100 of equipment. For example, in a sort, image data is read from the last page of the manuscript first sent by RDF180 in order toward the first page, and the read image data is memorized by hard disk 304b. The memorized image data is read from the last page in order toward the first page, and after repeating this the number of request times, it is outputted. Thereby, the same role as a sorter with two or more bottles can be played.
[0049] The image data read from hard disk 304b is sent to the smooth section 305. In the smoothing section 305, 1-bit data are changed into 8-bit data, and it changes the signal of image data into the condition of "0" or "255."
[0050] Although the image data changed into 8 bits carried out the multiplication of the multiplier on the matrix decided beforehand, and the concentration value of a nearby pixel, respectively, it is obtained from total and it is transposed to the average by which weighting was carried out. Thereby, binary data are changed into the data of a multiple value according to the concentration value in a nearby pixel, and near image quality can be reproduced with the read image. The graduated image data is inputted into gamma amendment section 306. In gamma amendment section 306, in case image data is outputted, conversion on the predetermined table in consideration of the property of the printer section 204 adopted as this reproducing unit is performed, and adjustment of the output according to the concentration value set up by the user by the control unit of the body 100 of equipment is performed. Image data is outputted to the printer section 204 after adjustment of an output.
[0051] Drawing 4 is a flow chart which shows the procedure of the image data memorized by hard disk

304b performed in the image processing system which consists of the above-mentioned configuration. This flow chart is performed by the idle time of equipment after copy processing is completed. In addition, the program for performing this flow chart is memorized by ROM207 of the CPU circuit section 205, and is performed by CPU206.

[0052] First, if it is checked whether the image data which the copy ended is in the field of a hard disk 304b throat (step S401) and a field is checked, it will be distinguished whether there is any elimination termination demand to the image data (step S402). An elimination termination demand shall be inputted into a copy demand etc.

[0053] When the answer of step S402 is affirmation (YES), the image data memorized by hard disk 304b is not eliminated, but this procedure is ended as it is.

[0054] It is distinguished whether when the answer of step S402 is negation (NO), the field which should eliminate image data exists in hard disk 304b (step 403), and when the answer is negation (NO), this procedure is ended as it is.

[0055] When the answer of step S403 is affirmation (YES), the image data memorized to one field in the field which should eliminate image data is eliminated, and it returns to the procedure of step S402 after that. Repeat activation of the procedure of step S402 to the step S404 is carried out until an elimination termination demand is inputted, or until the field which should eliminate image data is lost.

[0056] Since the image data which copy processing ended was eliminated according to the gestalt of this operation unless the elimination termination demand was inputted as explained above, sufficient security of a document can be attained.

[0057] Moreover, since elimination processing of image data is performed by the idle time of equipment after copy processing is completed, a user can perform copy processing, without being conscious of the processing.

[0058] (Gestalt of the 2nd operation) Next, the gestalt of operation of the 2nd of this invention is explained with reference to drawing 5 .

[0059] Drawing 5 is a flow chart which shows the procedure of the image data memorized by hard disk 304b performed in the image processing system concerning the gestalt of this operation. This flow chart is performed by the idle time of equipment after copy processing is completed. In addition, the program for performing this flow chart is memorized by ROM207 of the CPU circuit section 205, and is performed by CPU206.

[0060] First, it is checked whether the image data which the copy ended is in the field of a hard disk 304b throat (step S501), and it is distinguished whether there is any scramble termination demand to the image data (step S502). A scramble termination demand shall be inputted into a copy demand etc.

[0061] When the answer of step S502 is affirmation (YES), scramble processing of the image data memorized by hard disk 304b is not carried out, but this procedure is ended as it is.

[0062] It is distinguished whether when the answer of step S502 is negation (NO), the field which should perform scramble processing of image data exists in hard disk 304b (step 503), and when the answer is negation (NO), this procedure is ended as it is.

[0063] When the answer of step S503 is affirmation (YES), the image data memorized to one field in the field which should perform scramble processing of image data is taken out, and scramble processing is performed. For example, when image data is binary data, several bytes of image data is read from hard disk 304b, the theoretical sum of the image data and random number which were read is taken, and the value acquired as the result is again memorized by hard disk 304b. After scramble processing is completed, it returns to the procedure of step S502. Repeat activation of the procedure of step S502 to the step S504 is carried out until a scramble termination demand is inputted, or until the field which should perform scramble processing is lost.

[0064] Since it could be made not to perform time of reading the image data which performed scramble processing of the image data which copy processing ended, and was memorized by hard disk 304b according to the gestalt of this operation unless the scramble termination demand was inputted as explained above, sufficient security of a document can be attained.

[0065] Moreover, since scramble processing of image data is performed by the idle time of equipment

after copy processing is completed, a user can perform copy processing, without being conscious of the processing.

[0066] (Gestalt of the 3rd operation) Next, the gestalt of operation of the 4th of this invention is explained with reference to drawing 6 .

[0067] Drawing 6 is a flow chart which shows the procedure of the image data memorized by hard disk 304b performed in the image processing system concerning the gestalt of this operation. The program for performing this flow chart is memorized by ROM207 of the CPU circuit section 205, and is performed by CPU206.

[0068] In the gestalt of this operation, processing to the image data which the copy ended is not carried out to the idle time after copy termination. In that it was made to perform processing to image data when a part of power source (for example, power source for the display in a control unit) supplied to an image processing system like remaining-heat mode was turned OFF (i.e., when equipment changes into a standby condition) It differs from the gestalt of the 1st mentioned above and the 2nd operation. The procedure from step S601 shown in drawing 6 to step S605 is the same as the procedure of step S401 mentioned above to the step 405 shown in drawing 4 of the gestalt of the 1st operation.

[0069] Thus, since according to the gestalt of this operation elimination of image data was made to be performed when equipment changed into a standby condition, sufficient security of a document can be attained and a user can perform copy processing, without being conscious of the processing.

[0070]

[Effect of the Invention] Since it was made to process the outputted image data to predetermined timing according to the image-processing approach of the image processing system of claim 1, or the image processing system of claim 8 as explained above, the effectiveness that sufficient security of a document can be attained is acquired.

[0071] Since processing of image data is performed by the idle time of an image processing system to the timing immediately after outputting image data according to the image-processing approach of the image processing system of claim 2, or the image processing system of claim 9, the processing concerned is performed without making it conscious of processing being given to the user, and the effectiveness that sufficient security of a document can be attained is acquired.

[0072] Since processing of image data is performed to the timing from which an image processing system will be in a standby condition according to the image-processing approach of the image processing system of claim 3, or the image processing system of claim 10, the processing concerned is performed without making it conscious of processing being given to the user, and the effectiveness that sufficient security of a document can be attained is acquired.

[0073] Since processing of image data is performed to the timing from which a part of current supply means will be in a idle state according to the image-processing approach of the image processing system of claim 4, or the image processing system of claim 11, the processing concerned is performed without making it conscious of processing being given to the user, and the effectiveness that sufficient security of a document can be attained is acquired.

[Translation done.]